

(No Model.)

2 Sheets—Sheet 1.

R. E. BLASSER.

PULP FEED REGULATOR FOR PAPER MAKING MACHINES.

No. 567,636.

Patented Sept. 15, 1896.

Fig. 1.

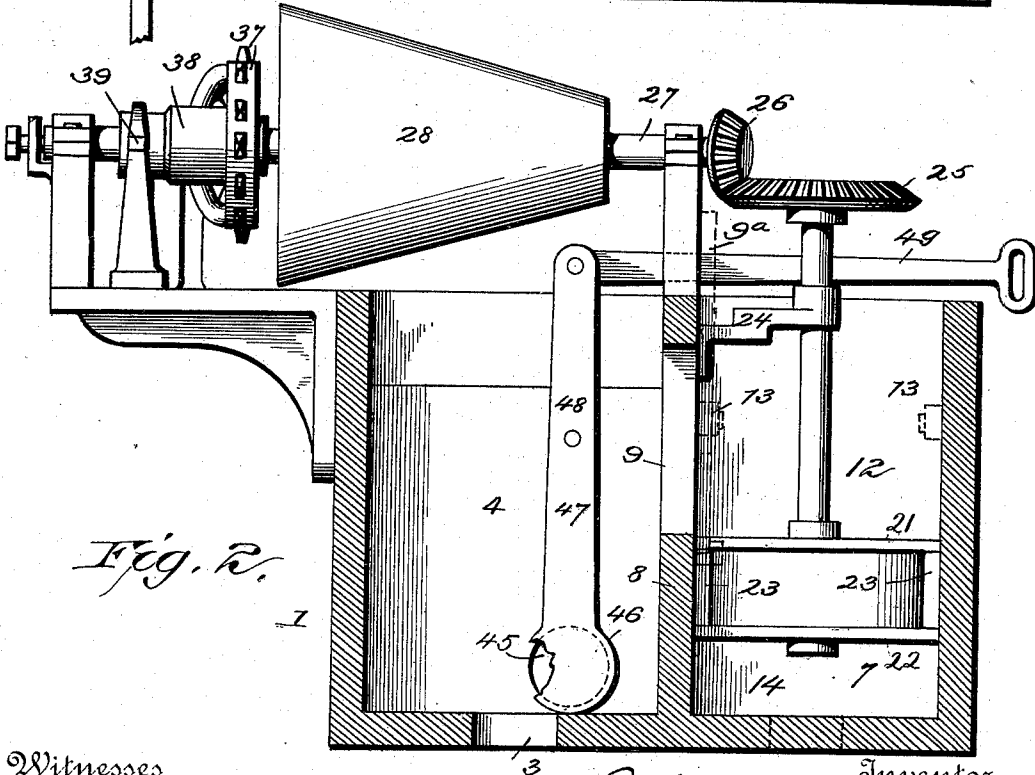
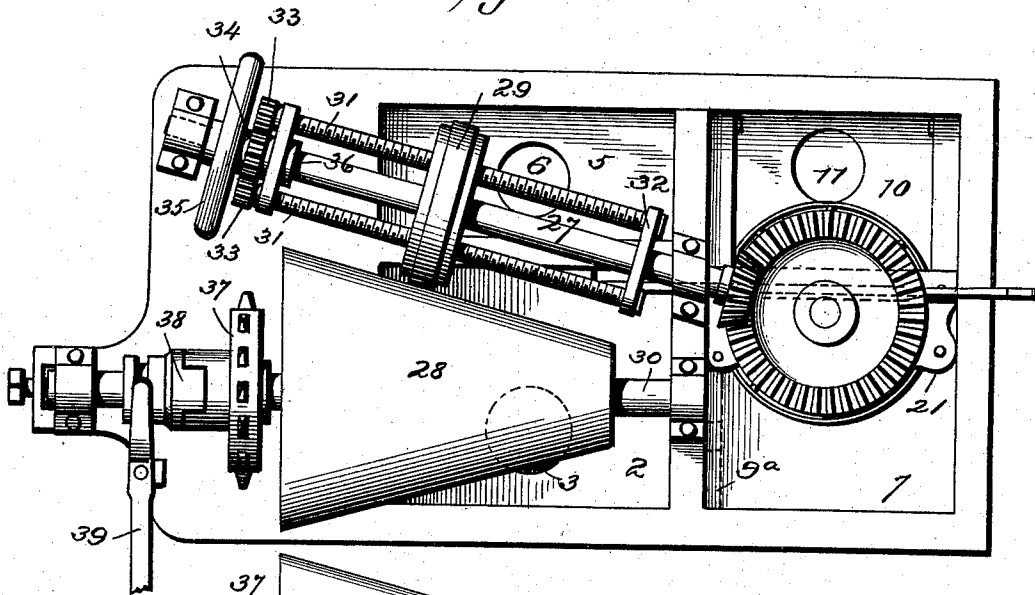


Fig. 2.

Witnesses
Alfred I. Gage.

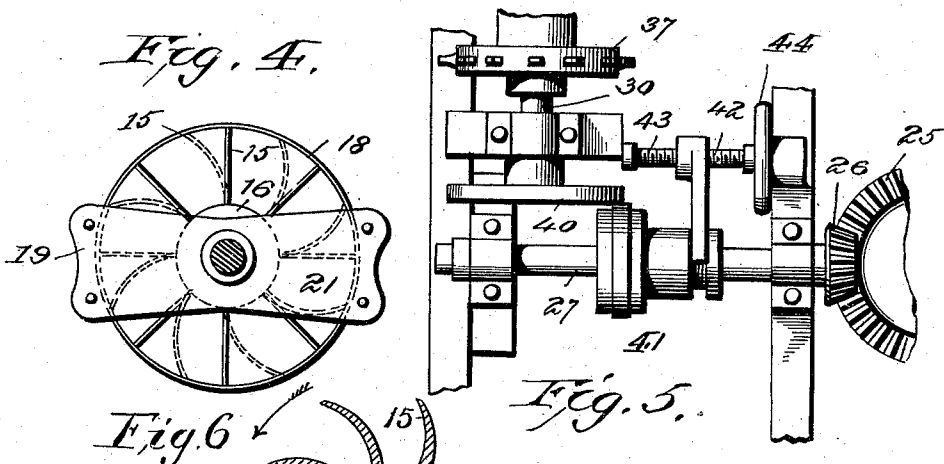
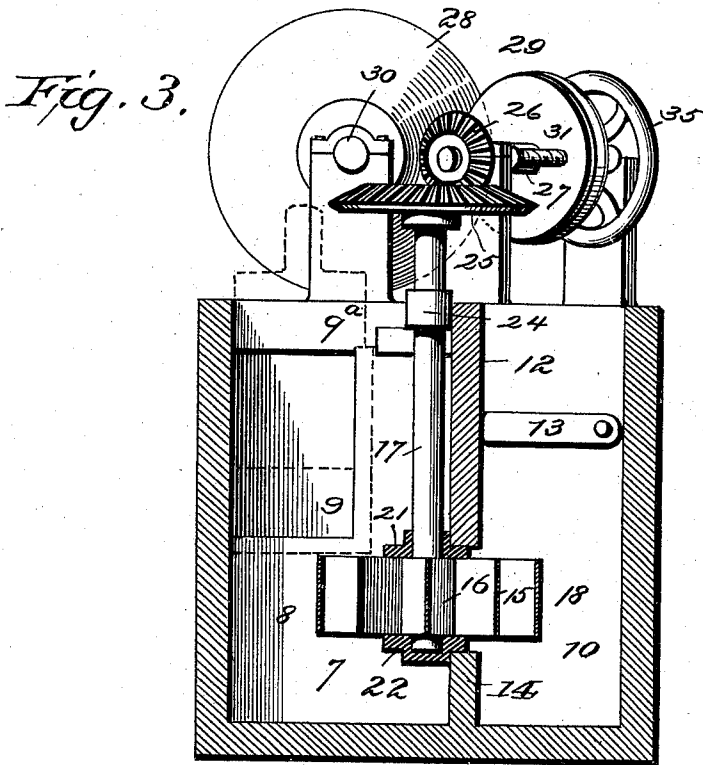
Inventor
Robert E. Blasser.
By *W. E. Stearns*
Attorney

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Robert E. Blasser,
by *W. E. Henderson*
Attorney

UNITED STATES PATENT OFFICE.

ROBERT EPHRAIM BLASSER, OF YORK, PENNSYLVANIA.

PULP-FEED REGULATOR FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 567,636, dated September 15, 1896.

Application filed May 25, 1894. Serial No. 512,439. (No model.)

To all whom it may concern:

Be it known that I, ROBERT EPHRAIM BLASSER, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Pulp-Feed Regulators for Paper-Making Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

My invention relates to paper-making machines, and has for its object to provide means for securing the passage of the paper-pulp through the stuff-chest to the fan-pump to produce a paper of a predetermined thickness and weight which will be uniform in its thickness and weight.

The invention consists, primarily, in an improved pulp-feeding construction for paper-making machines which employs a feeding device by which the paper-pulp is positively fed or carried onward in its movement from the stuff-chest to the fan-pump and a uniform pulp delivery secured, means for varying the speed of the feeding device preferably being provided so as to control the feed of the material as desired, and thus make the paper thicker and heavier or thinner and lighter by increasing or decreasing the speed. The invention includes, however, pulp-feeding constructions not employing means for varying the speed of the feeding device, and an improved feeding construction which may be used in feeding other material than pulp, together with certain specific constructions and combinations of parts, all of which will be fully described hereinafter, and specifically pointed out in the claims.

For a full understanding of the invention a detailed description of a construction embodying all the features thereof in their preferred form will now be given in connection with the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a stuff-chest embodying my invention. Fig. 2 is a side elevation thereof with the stuff-chest in vertical

section. Fig. 3 is a vertical cross-section through a part of the machine. Fig. 4 is a plan view of the feeding device and its guard. Fig. 5 is a plan view of a modified form of the speed-controlling mechanism. Fig. 6 is a horizontal section through the pulp-feeding blades or arms and the shield.

In the drawings the numeral 1 designates a stuff-chest, into the supply-chamber 2 of which the paper-pulp is passed in the ordinary manner from the main chest through the opening 3 in the bottom of chamber 2. The excess of pulp supplied to the chamber 2 over and above what is necessary to supply the fan-pump passes over the top of the partition 4 into the return-chamber 5, and from thence through the opening 6 back to the main chest. The receiving-chamber 7 is separated from the chamber 2 by a partition 8, and receives the pulp from chamber 2 through an opening 9 or otherwise, which opening may be provided with a sliding or other form of gate 9^a (shown in dotted lines) to close said opening when desired. To one side of the chamber 7 is a chamber 10, formed with an opening 11, which will discharge to the fan-pump in the ordinary manner the pulp which the chamber will receive from the chamber 7. The chamber 10 will be separated from the chamber 7 by a removable partition 12, which will be held in position by suitable means, for illustration, by buttons 13, so that by turning said buttons the partition 12 can be readily removed. Beneath the partition 12 is a partition 14, which may be stationary and which serves to separate the lower portion of the two chambers from each other. Under my invention the pulp is fed from the chamber 7 to the chamber 10 by means of a feeding device, preferably in the form of a paddle or spider, arranged in suitable manner to take the material from one chamber and deliver it into the other, the preferred manner being to arrange it in a vertical position, receiving the pulp horizontally, as illustrated in the drawings. The preferred construction of this feeding device is to make it of a series of blades or arms 15, which will extend from a hub 16 of a shaft 17, and which will be either straight, as illustrated by full lines in Fig. 4 of the drawings, or curved, as illustrated by the dotted lines in the same figure and in

Fig. 6, these blades thus forming a series of carriers by which the pulp is positively fed or carried onward. A rim 18, carried by these blades or arms, may be provided, as shown in Figs. 2 to 4, but practice has shown that it is preferable to omit this rim, so that the blades or arms may fill horizontally from their points inward as the blades move through the pulp on the receiving side. It is preferred to arrange this paddle or spider so that a portion of it will lie within the chamber 7 and another portion within the chamber 10, as illustrated clearly in Fig. 3 of the drawings.

In order to prevent any of the pulp which fills the chamber 7 from passing into the chamber 10 except when the spider or paddle is rotated, I provide a shield 19, which is preferably composed of a top and bottom plate 21 and 22, lying, respectively, across the top and the bottom of the paddle or spider, and end plates 23, connecting the top and bottom plates and lying close to and outside of the ends of the blades or arms 16, as illustrated in Figs. 4 and 6 of the drawings, the shield thus formed lying adjacent to the dividing partition between the chambers 7 and 10, as illustrated in Fig. 3 of the drawings. It will be obvious that under this arrangement the pulp cannot pass from chamber 7 into chamber 10 except upon the rotation of the paddle or spider. The shaft 17 is suitably supported and may be braced by a bracket 24, and has at its upper end a bevel-gear 25, with which meshes a pinion 26, attached to a shaft 27, to which motion is imparted so that the paddle or spider can be rotated. I provide any suitable arrangement of parts that will permit a change of speed of rotation of the paddle or spider, so that the feed of the material in chamber 7 to chamber 10 will be governed by the speed of rotation of the paddle or spider, and thus I control the thickness and the weight of paper by regulating the feed of the pulp to the fan-pump, which latter is not illustrated because it is of ordinary and well-known construction and operation. The faster that the paddle or spider is rotated, the faster the pulp is fed to chamber 10, and from thence to the fan-pump, and the thicker and heavier is the paper produced. By slackening the speed of rotation of the paddle or spider the pulp is fed slower and the thickness and the weight of the paper produced are less. It will be seen that the pulp is fed onward positively by the paddle or spider, so that a uniform delivery of the pulp is assured independently of variations in the rate of delivery of the pulp to the stuff-chest by the stuff-pump, so that paper of uniform thickness and weight can be produced and this thickness and weight may be controlled readily and accurately by varying the speed of rotation of the paddle or spider. The curved blades shown in dotted lines in Figs. 4 and 6 will be preferred, a better action being thus secured with such curved blades. It will be seen that the point of the blade

leaves the guard-plate 23 first and immediately begins to fill with pulp, so that the curve gives the blade more time to fill solid than with a straight blade, and on the opposite or delivery side the pulp commences to drop as soon as the point of the blade leaves the guard, and before one blade is entirely empty the next one commences to deposit its pulp, thus keeping a constant stream of pulp running into the fan-pump. This action will be clear from an examination of Fig. 6.

Various constructions may be employed for the purpose of varying the speed of the feeding device, but the preferred construction is that illustrated in Fig. 1 of the drawings. In this figure I show a cone 28, secured to a shaft 30, mounted in suitable journal-bearings, combined with a suitable friction-wheel 29, mounted upon the shaft 27 and in contact with the surface of the cone. As this friction-wheel is moved toward or from the base of the cone the speed of the friction-wheel is correspondingly lessened or increased, and as the friction-wheel turns with the shaft 27 the feed of the feeding device is correspondingly lessened or increased. For the purpose of adjusting this friction-wheel toward or away from the base of the cone I prefer to employ two screws or threaded rods 31, passing through the friction-wheel and journaled at opposite ends in the brackets 32, secured to the shaft 27 so as to turn therewith, the screws or rods turning loosely in the brackets and, as is obvious, engaging with screw-threads in the friction-wheel, so that by turning the screws or threaded rods the friction-wheel will be shifted on the rod 27 in the direction of its length. The rods 31 are provided at one end with cog-wheels 33, with which meshes the intermediate cog-wheel 34, which is adapted to be turned by the hand-wheel 35 so as to turn the screws or threaded rods for the purpose of adjusting the wheel, the parts being applied in any suitable manner for that purpose. For instance, the cog-wheel 34 may be on a sleeve 36, which may turn loosely on the shaft 27, and the hand-wheel 35 may be rigidly connected to the sleeve 36, or it may be adapted to be moved into connection therewith so as to clutch the same for the purpose of turning the sleeve 36 and its cog-wheel 34, the ordinary form of clutch having a notched and toothed connection, being suitable for the purpose, and being well known to every mechanic need not be illustrated in detail, as it is an obvious arrangement, and is not claimed herein.

The cone 28 is revolved by a sprocket-chain leading from a suitable source of power to the sprocket-wheel 37, mounted loosely on the shaft 30 and thrown in and out of operation by a clutch 38 on the shaft 30, which clutch is operated by a lever 39, this being an ordinary construction of clutch. Instead of employing the driving-cone and frictional wheel to contact therewith, I may employ a flat wheel or disk 40, mounted on the shaft 30, having the sprocket-wheel 37 for the transmission

of power thereto, and use a friction-wheel 41, feathered to the shaft 27, and adapted to be moved toward and from the center of the flat wheel or disk 40 by an arm 42, engaging the sleeve of the friction-wheel 41 and connected to a screw 43, operated by a hand-wheel 44, so as to move the arm 42 back and forth for changing the point of contact between the friction-wheel 41 and the wheel or disk 40, so as to change the speed of the shaft 27 by bringing the friction-wheel 41 nearer to or farther away from the center of the flat wheel or disk 40. This form and the form first described are suitable forms of mechanism for changing the speed of the rotation of the feeding device, but the invention is not limited to such forms, although both of these arrangements are believed to be novel with me in the combination in which they are employed. At times it is desirable to empty the chamber 2 entirely of paper-pulp, so that the pulp will not harden in the chamber by being allowed to stand when the machine is not in operation. For that purpose I form an opening 45 in the dividing wall or partition between this chamber and chamber 5, which opening is normally closed by a gate or valve 46, the stem 47 of which is fulcrumed at 48 and has connected to its upper end an operating-lever 49, so that when desired the valve can be thrown so as to uncover the opening 45, when the pulp in the chamber 2 can be forced through the opening 45 into the chamber 5 and from thence through the opening 6 back into the main chest.

I have shown and described with particularity what I consider to be the best construction and arrangement of parts for carrying out my invention; but I do not mean to be restricted to such details, as the invention is not confined thereto.

In operation, the pulp is pumped or forced from the main chest (not shown) into the chamber 2, which it fills, and from whence it passes into and fills chamber 7, and if the feeding device is in operation the material which fills the spaces between the blades of the device is carried by the device in its operation into the chamber 10 and there deposited, from whence it passes through the opening 11 to the fan-pump. If the feeding device operates too slowly for forming paper of a predetermined thickness and weight, it is caused to rotate faster by the mechanism already described, and if it feeds too fast, it is made to feed slower by the mechanism described, the speed of rotation controlling the weight and thickness of the paper. If it should be desired to operate the stuff-chest in the ordinary manner, the rotation of the feeding device is stopped by throwing the sprocket-wheel 37 out of operation and the removable partition 12 is taken out, when the paper-pulp will pass from the chamber 2 into the chambers 7 and 10 over the top of the feeding device and through the opening 11 to the fan-pump.

Having described my invention and set forth its merits, what I claim is—

1. In a paper-machine, the combination with a rotating feeding device for the paper-pulp comprising a series of vertically-arranged radiating feeding-blades rotating in a horizontal plane and curved in the direction of movement of the blades, of means for varying the speed of said blades to regulate the thickness and weight of the paper to be produced, substantially as and for the purpose described.

2. In a paper-machine, the combination with two compartments for the pulp, of a pulp-feeding device located at an opening between the two compartments and comprising a series of radiating blades curved in the direction of movement of the blades and acting to carry the paper-pulp from one compartment to the other, substantially as and for the purpose described.

3. In a paper-machine, the combination with two horizontally-arranged compartments for the pulp, of a pulp-feeding device located at an opening between the two compartments and comprising a series of vertically-arranged radiating feeding-blades rotating in a horizontal plane and acting to carry the paper-pulp from one compartment to the other, substantially as and for the purpose described.

4. In a paper-machine, the combination with two horizontally-arranged compartments for the pulp, of a pulp-feeding device located at an opening between the two compartments and comprising a series of vertically-arranged radiating feeding-blades rotating in a horizontal plane and curved in the direction of movement of the blades and acting to carry the paper-pulp from one compartment to the other, substantially as and for the purpose described.

5. In a paper-machine, the combination with a stuff-chest for the paper-pulp having two horizontally-arranged compartments, of a pulp-feeding device located at an opening between the two compartments and comprising a series of rotating carriers acting to carry the paper-pulp from one compartment to the other, substantially as and for the purpose described.

6. In a paper-machine, the combination with a stuff-chest for the paper-pulp having two compartments, of a pulp-feeding device located at an opening between the two compartments and comprising a series of vertically-arranged radiating feeding-blades rotating in a horizontal plane and arranged to receive the paper-pulp and carry it from one compartment to the other, substantially as and for the purpose described.

7. In a paper-machine, the combination with a stuff-chest for the paper-pulp having two compartments, of a rotating pulp-feeding device located at an opening between the two compartments and comprising a series of vertically-arranged radiating feeding-blades ar-

ranged to receive the paper-pulp and carry it from one compartment to the other, and means for varying the speed of the blades to regulate the rate of delivery of the pulp from one compartment to the other, substantially as and for the purpose described.

8. In a paper-machine, the combination of a stuff-chest for the paper-pulp having two compartments, a rotating device for feeding the paper-pulp from one compartment to the other comprising a series of vertically-arranged radiating blades entering the two compartments and acting to carry the paper-pulp from one compartment to the other, and a shield extending across the blades and arranged to prevent the paper-pulp from passing from one compartment to the other except as carried by said blades, substantially as and for the purpose described.

9. In a paper-machine, the combination with a stuff-chest for the paper-pulp having two horizontally-arranged compartments, of a pulp-feeding device located at an opening between the two compartments and comprising a series of vertically-arranged radiating feeding-blades rotating in a horizontal plane and arranged to receive the paper-pulp horizontally and carry it from one compartment to the other, and a device for controlling the speed of said blades comprising rotating driving and driven members and means for moving one of said members toward and from the center of the other member to vary the speed of the driven member, substantially as and for the purpose described.

10. In a paper-machine, the combination of a stuff-chest for the paper-pulp comprising two compartments, a removable partition between the two compartments, and a device for feeding the paper-pulp from one compart-

ment to the other, said device comprising a series of blades acting to carry the paper-pulp from one compartment to the other, substantially as and for the purpose described.

11. In a paper-machine, a stuff-chest comprising a supply-compartment to receive the paper-pulp from the main chest, a receiving-compartment to receive the pulp from said supply-compartment, a partition between said supply and receiving compartments formed with an opening for the passage of the material, a return-compartment to receive the pulp from the supply-compartment and return it to the main chest, a dividing-wall between said two compartments formed with an opening in its lower part and having its top edge below the top edge of the receiving-compartment for the overflow of pulp from the supply to the return compartment, and a valve controlling said opening and arranged to uncover the opening to permit all the paper-pulp to be passed from the supply-compartment to the return-compartment, substantially as and for the purposes described.

12. The combination with two compartments, of a feeding device located at an opening between the two compartments and consisting of the rotating feeding-blades curved in the direction of movement of the blades, and a shield coacting with said blades to prevent the passage of liquid from one compartment to the other except as forced by the blades, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT EPHRAIM BLASSER.

Witnesses:

JOHN D. GALLATIN,
PETER M. BECKER.